

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of )  
 )  
Application of Space Exploration Holdings, LLC ) File No. SAT-MOD-20181108-00083  
For Modification of Authorization for the )  
SpaceX NGSO Satellite System )

To: The International Bureau

**PETITION TO DEFER**

Astro Digital U.S., Inc. (“Astro Digital”) hereby submits this petition to defer the above-referenced application of Space Exploration Holdings, LLC (“SpaceX”) seeking, *inter alia*, authorization to relocate 1,584 satellites from their currently authorized altitude of 1,150 km to the requested altitude of 550 km (the “Proposed LEO Orbit”),<sup>1</sup> which is at or near the operating orbital altitudes of Astro Digital’s satellites, as well as those of many non-geostationary orbit satellite systems (“NGSOs”).<sup>2</sup> As explained in the Commercial Smallsat Spectrum Management Association (“CSSMA”) Comments and Petition to Defer,<sup>3</sup> SpaceX has failed to provide a

---

<sup>1</sup> Application of Space Exploration Holdings for Modification of Authorization for the SpaceX NGSO Satellite System, File No. SAT-MOD-20181108-0008 (filed Nov. 8, 2018) (“SpaceX Modification”).

<sup>2</sup> See Stamp Grant, Astro Digital U.S., Inc., IBFS File No. SAT-LOA-20170508-00071 (granted in part Aug. 1, 2018) (authorizing Astro Digital to deploy and operate up to five satellites between 475-625 km, and deferring action on the remainder of Astro Digital’s request to operate up to 100 satellites over a period of 15 years); see also Commercial Smallsat Spectrum Management Association, Comments and Petition to Defer, File No. SAT-MOD-20181108-0008, at 3-4 (filed Jan. 29, 2019) (describing other systems that operate or will operate in the 400-600 km orbital range) (“CSSMA Comments”).

<sup>3</sup> CSSMA Comments, Technical Annex at 1-2. Astro Digital supports the CSSMA Comments, including the accompanying Technical Annex, and hereby incorporates by reference those documents.

detailed collision risk analysis even though it is proposing to operate in “identical” or “very similar” low-Earth orbits as other constellations, as required by the FCC’s rules.<sup>4</sup>

Accordingly, the International Bureau (“Bureau”) should defer action on the SpaceX Modification until SpaceX provides the detailed collision risk analysis sufficient for others, such as Astro Digital, to evaluate the risk and impact to their respective systems. As explained in the CSSMA Comments, the increase in the number of satellites in the area and the larger mass and cross-sectional area of SpaceX’s satellites<sup>5</sup> may require that Astro Digital execute more differential drag maneuvers in response to potential conjunction events, resulting in a noticeable capacity loss and imposing an extraordinary burden on Astro Digital because its satellites are not operational during those maneuvers.<sup>6</sup> Moreover, as explained in the CSSMA Comments, deferring action on the application is appropriate because the SpaceX Modification raises significant policy issues<sup>7</sup> that are likely to be addressed in the Commission’s pending proceeding on the mitigation of orbital debris, as well potential proceedings of other federal agencies.<sup>8</sup>

---

<sup>4</sup> 47 C.F.R. § 25.114(d)(14)(iii); *see also Mitigation of Orbital Debris*, Second Report and Order, 19 FCC Rcd 11567 ¶ 50 (2004). Indeed, SpaceX fails to acknowledge that there may be operators at or near the Proposed LEO Orbit, other than Spire Global, Inc. and Kepler Communications, Inc., with which SpaceX states it will coordinate. SpaceX Modification, Attachment A Technical Information to Supplement Schedule S, at 44.

<sup>5</sup> Each SpaceX satellite is expected to have a mass of approximately 386 kg or approximately 80x the mass of a typical 3U cubesat. *See Application of Space Exploration Holdings, LLC for Authority to Launch and Operate an NGSO Satellite System (call sign S2983)*, File No. SAT-LOA-20161115-00118, Attachment A at 54 (Nov. 15, 2016).

<sup>6</sup> *See CSSMA Comments* at 4-5, n. 15. Most of those smallsats lack propulsion capability, or have limited propulsion capabilities ill-suited to perform the maneuvers necessary to accommodate the SpaceX Modification. As explained in the CSSMA Comments, even those satellites capable of executing differential drag maneuvers in response to potential conjunction events will experience substantial capacity loss because they are not operational during those maneuvers. *Id.*

<sup>7</sup> *See Id.* at 5-6 (discussing the unanswered policy questions raised by the SpaceX Modification).

<sup>8</sup> *See, e.g., Mitigation of Orbital Debris in the New Space Age*, Notice of Proposed Rule Making, IB Docket No. 18-313, at ¶ 98 (Oct. 25, 2018) (“*Orbital Debris NPRM*”); *Licensing Private*

In the alternative, Astro Digital requests that the Bureau condition any grant of the SpaceX Modification upon: (i) the company’s compliance with rules and policies adopted in applicable proceedings; and (ii) the company’s commitment to coordinate physical operations of its satellites in good faith with both current satellite operators, such as Astro Digital, and current and future applicants proposing to operate in the 400-600 km orbital altitude range.<sup>9</sup> Such a requirement would ensure the continued ability for Astro Digital and others to have fair and reasonable access to a critical shared orbital resource. As part of the good faith requirement, SpaceX should be required to take active responsibility for collision avoidance during orbit raising and end-of-life de-orbiting through low-Earth orbit. Further, SpaceX should not be permitted to request that other parties assume the full burden of avoiding collision with SpaceX’s 1,540 satellites.<sup>10</sup> Without such constraints, SpaceX could effectively determine which systems could operate in the 400-600 km orbital altitude range.

For all of the above reasons and those stated in the CSSMA Comments, Astro Digital urges the Bureau to defer action on the the SpaceX Modification or, in the alternative, impose conditions on any grant of the SpaceX Modification.

---

*Remote Sensing Space Systems*, Advance Notice of Proposed Rulemaking, 83 FR 30592, 30594 (June 29, 2018) (seeking comment on whether the Department of Commerce and the National Oceanic and Atmospheric Administration should establish debris mitigation requirements).

<sup>9</sup> See, e.g., *Space Exploration Holdings, LLC, Application for Approval for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System*, Memorandum Opinion, Order, and Authorization, 33 FCC Rcd 3391, 3396, ¶ 11 (2018) (requiring SpaceX to “coordinate its physical operations with space stations of NGSO systems operating at similar orbital altitudes”); *Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System*, Order and Declaratory Ruling, 32 FCC Rcd 5366, 5378, ¶ 25(d) (2017) (requiring OneWeb to “coordinate physical operations of spacecraft with any operator using similar orbits, for the purpose of eliminating collision risk and minimizing operational impacts”).

<sup>10</sup> See CSSMA Comments, Technical Annex, at Section B.

Respectfully submitted,

/s/ Jan King

Jan King  
Chief Technology Officer  
Astro Digital U.S., Inc.  
3171 Jay St  
Santa Clara, CA 95054

Dated: January 29, 2019

**CERTIFICATE OF SERVICE**

I, Daniel Landesberg, hereby certify that on January 29, 2019, a true and correct copy of this Petition to Defer was sent via U.S. Mail, first class postage prepaid, to the following:

William M. Wiltshire  
Paul Caritj  
Harris, Wiltshire, & Grannis LLP  
1919 M Street NW  
Suite 800  
Washington, DC 20036

*Counsel for SpaceX*

Tim Hughes  
Senior Vice President, Global Business and  
Government Affairs  
Space Exploration Technologies Corp.  
1155 F Street NW  
Suite 475  
Washington, DC 20004

Patricia Cooper  
Vice President of Satellite Government  
Affairs  
Space Exploration Technologies Corp.  
1155 F Street NW  
Suite 475  
Washington, DC 20004

/s/ Daniel Landesberg  
Daniel Landesberg